

REMARKS

Claims 1-23 are cancelled. New claims 24-33 are added. Upon entry of the amendment, claims 24-33 are presented for consideration by the Examiner.

Interview with the Examiner

On or about April 13, 2006, Counsel for Applicant telephoned the Examiner to discuss the Office Action mailed March 14, 2006. Counsel for Applicant was particularly interested in discussing rejections in which the Examiner stated that "process limitations are given little patentable weight in product claims." Counsel for Applicant suggested that the limitations in question resulted from the form of the claims and were not intended as process limitations. The Examiner suggested removing such limitations from the claim to avoid confusion.

New Claims 24-33

Applicant submits new claims 24-33 for consideration by the Examiner. New claims 24-33 do not include the process-like limitations identified by the Examiner in the Office Action mailed March 14, 2006.

New claims 24-33 require specific structural limitations not disclosed, taught or suggested by the prior art. In particular, claim 24 requires "each said land having a width measured perpendicular to said longitudinal axis, a majority of each said land having a substantially uniform height extending above said first diameter, said width being at least approximately five times said height." This structure for a pin is not disclosed, taught or suggested by the prior art. Further, as supported by Applicant's specification, this structure produces unexpectedly superior results, dramatically reducing insertion forces and improving retention of the pin in a host material. As discussed in the specification, higher profile formed surfaces were damaged when driven into a host material, resulting in reduced retention forces.

Claim 24 also requires that the helical lands be oriented at an angle of approximately 45° with respect to the longitudinal axis of the pin. This orientation is not taught in the prior art and contributes significantly to the unexpected results by distributing forces around a greater circumference than retaining features taught in the prior art.

U.S. Patent RE34,928 to Highfield, relates to a screw-threaded fastener for insertion into plastic material, where the insertion is assisted by ultrasonic vibration. Highfield discloses helical teeth oriented at an angle of approximately 45°. These "teeth or ribs" are formed by a knurl wheel and are comparable to prior art retaining features illustrated in Figure 1 of Applicant's specification.

There is no motivation to combine the teachings of Highfield with other cited references. The Examiner suggests that one of skill in the art would modify Kerb-Konus-Vertriebs (KKV) to include the 45° retention features taught by Highfield "to ensure particularly good performance and a particularly good interlocking fit between the lands and a substrate." Highfield teaches a screw threaded fastener to be inserted into plastic material with the assistance of ultrasonic vibration. This is a very different environment from the metal pin in metal host taught by KKV. Highfield does not teach that it is the orientation of the retention features that improves retention of the fastener, but that it is "alignment of the teeth in the two bands is thought to be important in installation." Highfield, column 3, ln. 9-11. There is no suggestion in either reference that a change in the angular orientation of the retention features would improve retention of a metal pin in a metal host.

Further, KKV teaches on page 4 "rolling in the spiral groove is extremely economical, since the spiral groove results in a very large pitch angle, and a correspondingly large machine feed forward can be used." The "pitch angle" referred to by KKV is an angle between a plane perpendicular to the longitudinal axis of the pin (such as A-A) and the helix formed by the grooves and lands. This angle is approximately 67°, e.g., "very large." KKV does not disclose, teach or suggest the

desirability of reducing the illustrated 67° pitch angle to the claimed angle of 45°. It is likely that such a change to the KKV design would render the described rolling operation decidedly less efficient by necessitating a corresponding reduction in the machine feed forward.

In sum, one of skill in the art would not be motivated to combine the very different and incompatible teachings of KKV and Highfield. The only possible motivation for such a combination is impermissibly found in Applicant's disclosure.

The prior art does not disclose, teach or suggest the limitations of claim 24. Claim 24 is patentable over the art cited by the Examiner. Claims 25–33 depend directly or indirectly from claim 24 and are patentable for at least the reasons stated in support of claim 24.

Claim 25 recites "wherein said second diameter is no greater than approximately 9% larger than said first diameter." Claim 25 includes limitations directed to the height of the formed portion with respect to the recited pilot portion of the pin. This relationship is not disclosed, taught or suggested in the prior art. Claim 25 is patentable for at least this additional reason.

Claim 30 recites "wherein the host material has a first hardness and said pin has a second hardness, said first hardness and second hardness measured on the Rockwell Rc scale and said first hardness is approximately 10 points higher on the Rockwell Rc scale than said second hardness." As discussed in Applicant's specification, the recited structures are of particular utility in assemblies where the host material is harder than the pin material. The low profile formed surface of the claimed pins resist damage during insertion into a hardened host material resulting in superior performance. Claim 30 is patentable for at least this additional reason.

Claims 31 and 32 specify that the pilot portion is at one or both ends of the claimed pin. The prior art does not disclose, teach or suggest pins having all of the structural limitations recited in claims 31 and 32. Claims 31 and 32 are patentable for at least this additional reason.

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Claim 33 recites "wherein said grooves have a width measured perpendicular to said longitudinal axis and the width of said grooves is approximately equal to the width of said lands." The prior art does not disclose, teach or suggest a pin having all of the structural limitations of claim 33. Claim 33 is additionally patentable for this reason.

For all the foregoing reasons, Applicant respectfully requests allowance of claims 24-33.

Respectfully submitted,

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